

IS MOREAU'S SUNBIRD *NECTARINIA MOREAUI* A HYBRID SPECIES?

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Moreau's Sunbird *Nectarinia moreaui* is at present considered to be a member of a superspecies whose other members are *N. loveridgei*, *N. mediocris*, *N. regia* and *N. rockefelleri* (Hall & Moreau 1970). It was once considered to be a subspecies of the Eastern Double-collared Sunbird *N. mediocris*, but Williams (1950) regarded it as a separate species on the basis of plumage characteristics. *Nectarinia moreaui* is a Tanzania endemic, restricted to the forests of the Nguru, Ukaguru and Uvidunda Mountains (Turner 1977). Loveridge's Sunbird *N. loveridgei* is restricted to the nearby Uluguru Mountains. The much more widespread *N. mediocris* occurs in mountain forests from Kenya south to Malawi and Mozambique, with the exception of those areas where *N. moreaui* and *N. loveridgei* occur. Hall & Moreau (1970) note that "it is remarkable that *N. moreaui* and *N. loveridgei* should break the range of *N. mediocris* as they do." In this paper we present a theory that accounts for the strange distributions of these three species.

THE THEORY

It is suggested that *N. mediocris*, *N. loveridgei*, *N. regia* and *N. rockefelleri* are descendants from one, formerly widespread, parent species. The range of this species is thought to have contracted to a few small forest refuges during periods when forest extent in Africa was at a low. The resulting fragmentation of the range of the parent species created ideal conditions for speciation. Possible forest refuge localities for the evolution of the species observed today would be the Usambara Mountains for *N. mediocris*, the Uluguru for *N. loveridgei*, and forest refuges in western Uganda or eastern Zaïre for *N. regia* and *N. rockefelleri*. These localities are all suggested as forest refuges by Hamilton (1976). With the subsequent increase in the extent of the forest there were opportunities for all four species to spread. *Nectarinia regia* spread along the mountains of the western rift, as did *N. rockefelleri* to a lesser extent. *Nectarinia mediocris* spread out from the Usambaras, north into Kenya, and south into Malawi and Mozambique. Unlike these other three species, *N. loveridgei* has not extended its range beyond its postulated ancestral refuge (i.e. the Uluguru Mountains). However, we suggest that it did once spread as far as the nearby Uvidunda, Ukaguru and Nguru Mountains (all of which are within 100 km of the Uluguru) and there hybridized with *N. mediocris* to form the species we now call *N. moreaui*. The range of *N. mediocris* was thus split into two isolated units.

EVIDENCE FOR THE THEORY

Apart from the distributional evidence given above, there is further support for the theory that *N. moreaui* is a hybrid between *N. loveridgei* and *N. mediocris*, from plumage and other physical characteristics. Skins were examined by TAVdW in the British Museum (Natural History). The sample size was as follows:

	males	females
<i>N. moreaui</i>	5	4
<i>N. loveridgei</i>	9	4
<i>N. mediocris usambarica</i>	11	4
<i>N. m. fuelleborni</i>	16	3

Nectarinia m. usambarica is the subspecies of *N. mediocris* occurring directly to the north of *N. moreaui*, *N. m. fuelleborni* occurring to the south. The comparison of these species follows.

Size: decreasing in the order *N. loveridgei*, *N. moreaui*, *N. mediocris*.

Feet: black in all species.

Iris: brown to black in all species.

The following comparisons are for males only.

Rump: tips of upper tail coverts almost purple in *N. loveridgei*, and *N.m. fuelleborni*; a hint of purple in *N. moreaui*; royal blue in *N.m. usambarica*.

Back: glossy bronzy green in *N. mediocris* and *N. moreaui*; more green, with only a hint of bronze in *N. loveridgei*.

Head: bronzy green in all cases, except a little variation in *N. moreaui*, where the green may be less pronounced or even replaced with purplish.

Wings: primaries and secondaries are brown, edged with yellow in all species; upper wing coverts are bronzy in *N. mediocris*, from bronzy to decidedly green in *N. moreaui*, and green in *N. loveridgei*.

Belly: yellowish grey to bright yellow in the order *N.m. usambarica*, *N.m. fuelleborni*, *N. moreaui*, *N. loveridgei*.

Chest: the red band is broader and more intense in *N.m. fuelleborni* than in *N.m. usambarica*. In *N. moreaui* it is broader still, being no longer a band but a patch. The yellow patches at the sides of the red band are larger in *N.m. fuelleborni* than *N.m. usambarica*. In *N. moreaui* they are larger still, extending a good deal further down and also medially towards the centre of the chest. This means that *N. mediocris* (both subspecies) has a transverse red chest-band with patches of yellow at the sides, whereas *N. moreaui* has a red patch with longitudinal lines of yellow at the sides. The red in *N. moreaui* is variable in colour, some specimens being almost as red as *N. mediocris*, others being almost as orange as *N. loveridgei*. In *N. loveridgei* there is a definite orange patch (as opposed to a red band) bordered by the yellow of the belly on three sides. The purple/blue collar is present in all species. In *N. loveridgei* it is purple. In *N. moreaui* it seems to be slightly more purple than the blue of *N. mediocris*.

Throat: bronzy green in all species.

The following comparisons are for females only.

Nectarinia m. usambarica and *N.m. fuelleborni* are almost indistinguishable, *fuelleborni* being slightly brighter. Both have a greyish-yellow belly, and neither has any sheen whatsoever. *Nectarinia loveridgei* is brighter yellow on the belly. Like *N. mediocris* it is olive-brown on the back, but has glossy turquoise blue tips and edges to the back feathers, and purplish-blue tips and edges to the head feathers. *Nectarinia moreaui* has a belly intermediate in colour between *N. mediocris* and *N. loveridgei*. It has a turquoise sheen on the back, though this is less pronounced than in *N. loveridgei*, and no sheen on the head.

These comparisons lend considerable support to the theory outlined above. Not only does *N. moreaui* appear to be intermediate between *N. mediocris* and *N. loveridgei*, but it also shows considerable variation in its plumage, as would be expected of a hybrid species.

DISCUSSION

In the light of the evidence presented in this paper we believe *N. moreaui* to be a stabilized hybrid species between *N. mediocris* and *N. loveridgei*. We are familiar with all three species in the field and can confirm that they have similar ecological requirements, preferring the middle and upper strata of

mountain forest. Their songs appear to us to be identical.

The concept of a stabilized hybrid species in East Africa is not new. Hall (1963) proposed such a theory for the Grey-breasted Spurfowl *Francolinus rufopictus*, as did Hall & Moreau (1970) for Hinde's Babbler *Turdoides hindei*.

Nectarinia moreaui is unusual amongst the endemic birds of the forests of eastern Tanzania in that it appears to be the result of recent speciation. Most of the rare birds of these forests are probably much older relict species: such are the Dappled Mountain Robin *Modulatrix orostruthus* and the Long-billed Apalis *Apalis moreaui* (see Stuart, in prep.), Mrs Moreau's Warbler *Bathmocercus winifredae*, the Uluguru Bush Shrike *Malaconotus alius*, and the Usambara Weaver *Ploceus olivaceiceps nicolli*. Unlike some of these species, *N. moreaui* is abundant in some parts, if not all, of its small range. The forests which it inhabits are in remote areas of low human population density, where forest destruction is not a serious threat, and it is therefore in no immediate danger.

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